there *Megatherium, Mylodon, Macrauchenia, Hippidium, Mastodon* and many other quadrupeds. Mr. Otto Nordenskjöld has found tertiary plants there; remains of quadrupeds, will also be met with.

The Antarctic world offers a magnificent field for discovery to explorers.

ALBERT GAUDRY

QUOTATIONS

THE PHYSICIAN IN THE SCHOOL

THE International Conference on School Hygiene, held in London this month, raised many questions which should search the hearts of teachers, parents, and taxpayers in America. Some of these questions we have already been debating. In this city last winter Superintendent Maxwell urged that the eyes of school children be examined, and that glasses be provided—if necessary at public expense—for those whose sight is defective. The shortest way with such a proposal is to give it a bad name and damn it. Accordingly, the plan was received by a part of the press with jeers and cries of "Socialism!" Mr. Maxwell's reply was in effect that we are spending millions a year for teachers, buildings, text-books, and apparatus; and that it is worth while to lay out a little more in order to enable all the children to profit by these facilities. In an article in our own columns last April he said:

> It seems folly to supply books to children who can not read them, or to place children in classrooms when they can not see what is written or drawn on the blackboard. If the sight is defective, the child is hopelessly handicapped. The expenditure of a few thousand dollars for glasses would enable thousands of children who are now unable to do their school work to stand on the same level with their fellows.

These words sum up briefly the whole argument for the physical examination of school children and the attempt to keep them in such health that they can fairly avail themselves of the advantages offered. We can not dismiss the matter with a question-begging epithet. Our American school boards must consider the project on its merits, and decide whether, in justice to the children as well as to the community as a whole, we should not devote more attention to the physical well-being of pupils. —The New York *Evening Post.*

CURRENT NOTES ON LAND FORMS

OTAGO PENINSULA, NEW ZEALAND

OTAGO PENINSULA is a land-tied island on the east coast of southern New Zealand. An interesting account of its features is given by P. Marshall, professor of geology in Otago University at Dunedin, near the head of the Otago Bay, which the peninsula encloses. ("The Geology of Dunedin, New Zealand," *Quart. Journ. Geol. Soc.,* LXII., 1906, 381–424). The peninsula is a complex mass of volcanic rocks, which, while the district stood towards 1,000 feet higher than now, was submaturely dissected; that is, the valleys, still narrow and of rapid descent in their upper courses, became more open and of gentler descent in their middle and lower courses; and the slopes came to have only moderate declivity. During submergence to its present level, the mountainous mass was cut off from the mainland by the drowning of a connecting ridge on its northwestern side; it thus became an island, about 14 miles long northeast-southwest, and not more than six miles wide, with summits still reaching more than 1,000 feet above the sea, and with much irregularity of outline as would be expected. Since the district assumed this attitude, the exposed headlands, on the mainland as well as on the island, have been cut back in strong cliffs, from 300 to 800 feet high; the smaller reentrants have been filled with beach-fronted sands; the larger reentrants have been more or less completely enclosed by bay-mouth spits and bars; and Otago strait, as the original water passage back of the island might be called, has been closed at its southwest end, under the guidance of the prevailing long-shore current from the southwest, by a beach-fronted sand-isthmus, which converts the strait into a long bay. The southward direction of growth of several bay-mouth spits and reefs suggests that they are controlled by backset eddies, which sweep around the new-built shore lines between the projecting headlands in a direction opposite to that of the main, long-shore cur-

rent. Otago peninsula would thus in several respects resemble Banks peninsula, on the same coast farther north; for this is again a dissected and formerly insular volcanic mass with a ragged and cliffed outer shore line, now transformed into a peninsula not only by the flying northeast stretch of Ninety-mile beach, but apparently also by the forward growth of the fluviatile Canterbury plains in the sheltered waters back of the former island.

Marshall's account of Otago peninsula proceeds on the "two bites of a cherry" method of first describing the various surface features, and then explaining their origin. So cautious a method may be appropriated in treating land forms of uncertain origin; but its employment in so simple a case as this one would seem to indicate an undue consideration for those who even in this day need to have it explained that bays are half-drowned valleys. Much space might be saved if the peninsula were briefly described as having been submaturely dissected in a former cycle of normal erosion, and as, after a depression of towards a thousand feet, being now vigorously attacked by the sea on the new shore line which is already advancing towards maturity on its seaward side. It is a great advantage to the reader to have the essence of the story thus presented in condensed form at the outset; the details can then be easily apprehended in their proper relations as they are reached in further reading.

The Fayûm Depression, Egypt

Imagine a series of strata, of which certain members, *J* to *P*, are 700 meters in thickness, dipping very gently to the northwest. Let the lower formation, *J*, be a resistant limestone, 30 m. thick; the next formation, *K*, a series of weak clays and marls, 70 m. thick; and the following members, *L* to *P*, a succession of alternately resistant and weak strata, 480 m. thick. Conceive the whole series worn down nearly to baselevel in a desert climate, thus producing a broad peneplain on which the beveled strata appear in belts trending northeast-southwest. Now let the peneplain be uplifted with a gradual slope to the north, so as to gain an altitude of 300 or 400 m. in the district here especially considered; and in consequence of this uplift imagine the barren surface to be dissected to a stage of maximum relief by the winds and occasional rains. The weak belt, *K*, will thus be irregularly excavated as a subsequent depression along the strike of the guiding formation; the depression will be bordered on the southeast by a structural or "dip" plain of the underlying limestone, *J*; and enclosed on the north by three cuestas, rising in ragged escarpments, *L*, *N*, *P*, and separated by broad steps, *M*, *O*. The upland beyond the highest escarpment will gradually descend far northward to the sea, younger and younger formations being crossed on the way; while in the opposite direction the rising plain of the underlying limestone cuesta, *J*, will presumably break off in a southeast-facing escarpment overlooking another subsequent lowland eroded on underlying strata; . . . and so on to the basement old-land.

The waste from the depression eroded on the weak belt, *K*, having been largely exported as dust by the winds, the floor of the depression will sink here and there in enclosed basins, which may be excavated even below sea level; and the basins will be separated by low residual portions of the weak strata, which will form what may be described as transverse barriers or ridges—there being as yet no technical name for such features. Along the eastern side of the district, toward which the uplifted peneplain may have had a faint slope, imagine an additional uplift by faulting or monoclinal bending; and along the trough thus defined let a large north-flowing river erode a mature valley through the desert. The western side of the valley will vary in height as it obliquely cuts the several cuestas; with the eastern side we are not especially concerned. While the main valley is worn down contemporaneously with the general dissection of the peneplain, the river happens, by lateral erosion, to wear through the first transverse barrier in the weak beds, *K*, that separates the valley from a neighboring subsequent basin; a branch of the river then flows into the basin and forms a lake; but as the river continues to

deepen its valley, it fails after a time to supply the lake, which thereupon disappears by evaporation; only to be formed again later when the river, having aggraded its valley, supplies an artificial canal that is led into the ancient lake-bed for irrigation, with the result of forming a small lake in the bottom of the depression.

Such, in generalized terms, is the impression gained from reading "The topography and geology of the Fayûm province of Egypt," by H. L. Beadnell (Survey Dept. Egypt, Cairo, 1905, maps, sections and fine plates). The river is the Nile. The north-sloping upland is "the great undulating high-lying gravelly desert-plateau which stretches with little change of character to the Mediterranean" (p. 15). Its southern margin is the uppermost escarpment (*P*), Jebel el Qatrani, capped with basalt, which supplies a black talus to the slopes below; it is in these slopes and in those of the next lower escarpment (*N*), that the strata have recently (1901) been found to contain numerous mammalian fossils, for which Osborn's American Museum party has recently searched (see SCIENCE, March 29, 1907). Where the Nile valley cuts the next cuesta (*L*), the corner of the escarpment stands forth in a commanding bluff, Elwat Hialla, from which one may gain a broad view up and down the river, with Cairo and the Pyramids in the north, the yet higher escarpment of the uplifted desert plateau on the east, and the first of the subsequent basin-depressions to the southwest, holding the oasis of the Fayûm, watered by the Bahr el Yusef from 200 kil. up the Nile, and the shallow lake, Birket el Qurun, some 40 kil. long, with its bottom about 50 m. below sea-level; while the dip plain of the lower limestone (I, Eocene) ascends slowly in the southern distance. In ancient historic times, the depression contained the much larger Lake Moeris, which then served to regulate the flow of the lower Nile; and in still earlier, pre-historic times here stood a similar lake, now recognized by its silts. Additional small basins occur farther southwest. Still farther away in the same direction, the weak strata rise to "the ordinary desert plateau, on which the outcrops of the beds of successive rock stages follow one another in regular order from south to north, but without forming well-marked topographic features" (p. 27): it is on the strength of this brief statement regarding the beveling of the rock series that we have inferred the (Miocene) peneplanation of the region; possibly an insufficient foundation for a broad generalization. The winds are still effective agents of erosion and transportation; rock ledges are described as wonderfully carved by sand blast (p. 85); and long sand-dune windrows are common, a remarkable one being shown in plate XV.; nevertheless, the occasional action of wet-weather streams is evidently dominant in determining the details of the ragged escarpments, which repeat bad-land forms, familiar in our western country.

Whether the generalized statement given above is correct or not, it is not easy to say; for translations from the topographic description of an observer acquainted with the ground, into systematic physiographic description by a reviewer who has not seen the ground, is admittedly difficult. There need be no question as to the stratigraphic sequence, for that is set forth in the systematic fashion of established geological terminology; but the topographic features produced by the work of desert erosion are not described in terms of standardized type forms, hence the translation from empirical to systematic language is somewhat uncertain.

Shall the linear depressions and reliefs of the Fayûm basin and the escarpments to the northwest be called "vales" and "wolds," as suggested by Veatch (see these notes for June 14, 1907)? The ragged escarpments of the cuestas have no likeness to the softly rounded forms of the Lincolnshire and Yorkshire "wolds"; and the barren misery of the unirrigated desert depressions is strongly at variance with the connotation of an agreeable landscape, usually suggested by "vale."

THE ARID CYCLE IN EGYPT

H. T. FERRAR, lately of the British Antarctic expedition and now of the Geological

Survey of Egypt, briefly inquires under the above title (Survey Notes, Cairo, 1906, 18–20), whether the deserts bordering the Nile offer illustrations of "the geographical cycle in an arid climate" (see *Journ. Geol.*, xiii., 1905, 381–407), and suggests that forms in various stages of arid development are recognizable at many localities. He offers a number of examples of independent basins with local centripetal drainage, which are taken to represent the youthful stage of the arid cycle. "Most members of the Geological Survey [of Egypt] have shown that the Nile valley was once occupied by a series of fresh-water lakes in which calcareous travertine and other lacustrine products were deposited"; but the brief text does not suffice to show whether these basins were "initial," that is, due to inequalities in the originally uplifted land surface, or whether they were due to the long-continued desert erosion of such a surface, the basins being temporarily occupied by lakes during a moist climatic epoch of brief duration. The probability of the survival to-day of any initial basins in the region of the Nile is contradicted by the evidence of long-continued erosion presented in the preceding note. Examples of the disintegration of drainage, supposed to be characteristic of an advanced stage of the arid cycle, are also instanced by Ferrar; but the disintegration here noted is due to obstruction by invading sand dunes, and not to the excavation of shallow basins by wind action, as suggested in the general scheme of the arid cycle.

The interest thus manifested in the physiographic study of desert forms leads us to hope that their detailed and systematic description may be forthcoming in the publications of the Egyptian survey; but the possibility of finding, even in the deserts that border the Nile, the results of arid erosion, not dominated by the occasional action of flooded streams, is made improbable by the account of the sudden rain-floods ("seils") given by H. G. Lyons, director general of the survey department of Egypt in his admirable report on "The physiography of the River Nile and its basin" (Cairo, 1906). A few local rainstorms occur every winter east of the Nile, where the slope from the desert plateau toward the river is well marked. "In about every second year one or other of the larger wadies comes down in flood, sometimes so suddenly as to carry away camels and sheep. . . . Their effect in eroding the desert is immense. . . . These 'seils' are less rare than is usually supposed, and the dry arid appearance of the desert, together with the rareness of rain, cause the effect of such storms as do occur to be underestimated." Yet on the lower desert upland west of the Nile, it appears that the occasional rainfall "drains into shallow windworn depressions and there soaks into the rock or is soon evaporated" (p. 293, 294).

The reviewer finds difficulty here, as in the preceding note, in the attempt to translate a general descriptive account into a systematic account, in terms of structure, process and stage.

W. M. D.

INTERNATIONAL CONFERENCE ON PLANT HARDINESS AND ACCLIMATIZATION

An important conference will be held under the auspices of the Horticultural Society of New York on October 1, 2 and 3 in rooms of the American Institute and the Museum building of the New York Botanical Garden.

The preliminary list of papers to be presented is as follows:

D. T. MacDougal, Tucson, Ariz.: "The Determining Factors in the Seasonable Activity of Plants."

Henry C. Cowles, University of Chicago: "Factors that control Acclimatization."

B. L. Livingston, Tucson, Ariz.: "Evaporation as a Climatic Factor influencing Vegetation."

Ernst A. Bessey, Subtropical Laboratory, Miami, Fla.: "Air Drainage as affecting Hardiness of Plants."

Frederic E. Clements, University of Nebraska: "The Real Factors in Acclimatization."

W. M. Hays, Assistant Secretary of Agriculture: "Plant Improvements needed in Specific Cases."

J. C. Whitten, Missouri: "Comparative Hardiness of Plants of the same Variety from Northern and Southern Points."

M. Robert, Algeria: "Observations on Eucalyptus Hybrids; The Japanese Loquat in Al-